

Beaver Creek Analysis Area Allotment Management Plan Revisions

Livestock Grazing & Rangeland Vegetation Specialist Report

Prepared by:

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Introduction

The following specialist's report is designed to partially satisfy the NEPA requirements of the United States Department of Agriculture, Forest Service (USFS). This report addresses effects of three alternative actions to rangeland and invasive plant resources within the Beaver Creek Analysis Area Allotment Management Plan Revision project. A separate specialist's report has been prepared for Threatened, Endangered, and Sensitive plant species and is located in the project file. The Legal and Administrative Framework for this project is as follows:

- The Bighorn National Forest Land and Resource Management Plan (LRMP) revised 2005.
- FSM2200 – this manual summarized laws and regulations governing rangeland management and forest planning.
- FSM2600 – this manual summarizes laws and regulations governing fish and wildlife management and forest planning.
- R-2 Rangeland Analysis and Management Training Guide
- FSH 2209.13 – Grazing Permit Administration Handbook
- FSH 2609.13 – Wildlife and Fisheries Program Management Handbook
- Code of Federal Regulations (CFR) 36
 - ♦ 219 Planning
 - ♦ 222 Range Management
 - ♦ 241 Fish and Wildlife
- National Forest Management Act (NFMA) of 1976 – this act identifies information requirements concerning NFS grazing and browsing resources.
- Section 8 of the Public Rangelands Improvement Act (PRIA) of 1978 – this section allows for consultation and cooperation in the development and execution of allotment management plans for grazing permits.
- Federal Crop Insurance Reform and Department of Agriculture
- Reorganization Act of 1994 amended the 1987 Agricultural Credit Act to provide for mediation of grazing permit cancellation and suspension actions as a part of the existing administrative appeals process.
- Section 504 of the Rescissions Act of 1995, Public Law 104-19, directs the Forest to complete site-specific National Environmental Policy Act Analysis and decisions on allotments.

Overview of Issues Addressed

- Effects of livestock grazing actions on permittees – social and economic concerns.
- Rangeland health and effects of livestock grazing on plant communities.
- Invasive plants (noxious weeds)
- Conifer encroachment and big sagebrush density

Affected Environment

Information used for development of the affected environment came from 2210 and 2230 files and are available in the Medicine Wheel-Paintrock Ranger District Office. The information derived from these files included field and meeting notes, previous Allotment Management Plans, long term monitoring (Parker 3 Step data), range analysis data, Analysis of the Management Situation documents, and correspondence. Firsthand experience of Forest Service employees in administering the term grazing permits, working with permit holders, monitoring, and collecting data was considered. Parker 3 step data was analyzed and is summarized in the attached Appendix A (Summary of Vegetative Analysis for Beaver Creek AMP Analysis Area) and Appendix B (Parker 3 Step Transect Summary) of the range specialist's report. The actual forms from field data collection and summaries of these forms are found in the 2210 Range Management Planning Transect Data folders in the Medicine Wheel-Paintrock Ranger District Office.

Existing Condition

Antelope Ridge S&G

The Antelope Ridge S&G allotment lies north of Highway 14A and southwest of Dayton Gulch Road to the Medicine Wheel and Tongue Ranger District boundaries. Elevations range from approximately 8,900 to 9,950 feet. The allotment contains approximately 3,092 acres of which 1,763 acres are considered suitable for livestock grazing based on the 2006 Updated Analysis (appendix F). The suitable range is primarily sub-alpine uplands dominated by Idaho fescue and sedges. There are some scattered to dense stands of sub-alpine fir and Engelmann spruce. Meadows occur at the headwaters of Lick and Lake Creeks. Wetlands and riparian habitats are present in minimal amounts.

Records indicate the allotment has been used by sheep since at least 1925 and in general has been stocked with less than permitted numbers since about 1960. Cattle drift up the Lick and Lake Creek drainages and onto the allotment has been documented over the years. The 1980 range analysis showed approximately 66% of the allotment was listed in unsatisfactory condition. Satisfactory condition is defined as range in fair or better condition with an upward trend or good or better condition with a stable trend. Capacity was estimated at 2276 sheep months; however the range analysis stated if management is not intensive the capacity may need to be reduced. (1980, Antelope Ridge). Overuse was attributed to poor herding, bedding too long on one bedground, and cattle drift. The current AMP was developed and approved in 1982 and outlined a 3 pasture deferred rotation, which has been followed. Beginning in 2002, this allotment began being managed in common with the Bear/Crystal Creek S&G and Beaver Creek S&G allotments, with one band of sheep being run in a deferred rotation across 10 pastures. This basically reduced the stocking rate on Antelope Ridge S&G because dry ewes/yearlings are being run rather than Ewe/lamb pairs, and with the added flexibility due to one band running across three allotments there is a resulting reduction of approximately 50% animal months being grazed on Antelope Ridge based on authorized use since 2002. The effects from this reduction in stocking will not likely be realized for at least 10-15 years due to the vegetation being predominantly high elevation uplands. The Antelope Ridge S&G allotment is not fenced and contains only 1 developed water source, a stock pond that collects snowmelt.

Due to the reduction in stocking rates and higher issues elsewhere on the District, this sheep allotment has not been monitored intensively in the past several years.

Bear/Crystal Creek S&G

The Bear/Crystal Creek S&G allotment lies South of Highway 14A and north of Whaley Creek and includes ridge top terrain south of Bald Mountain. Elevations range from approximately 5,000 feet to 10,050 feet. The allotment contains approximately 7,329 acres of which 2,375-acres are considered suitable for livestock grazing based on the 2006 Updated Analysis (appendix F). Bear Creek S&G and Crystal Creek S&G were originally run as separate sheep allotments with one band of sheep grazing on each allotment from approximately 1930 until about 1989.

Allotment notes indicated a history of stocking problems on both allotments. In 1989 the two allotments were combined and stocking was reduced to one band of 1100 ewe/lambs running in rotation across the newly combined Bear/Crystal Creek S&G allotment. This resulted in approximately a 42% reduction in permitted SMs and put stocking in line with estimated capacity based on the 1987 range analysis and two years of subsequent monitoring (1989 Addendum to AMP).

In 2002 the permittee on Bear/Crystal, Beaver Creek, and Antelope Ridge S&G allotments waived his permit back to the Forest Service and created an opportunity to move a permittee from the Shoshone National Forest to the Bighorn National Forest. This resolved resource and operator concerns on the Shoshone and resulted in an additional 32% reduction (based on ewe/lamb equivalents) in the overall stocking across the combined Bear/Crystal, Beaver Creek, and Antelope Ridge S&G allotments, providing greater overall flexibility in management.

With continued sheep grazing on the allotment at the levels that are presently permitted, it is expected that the vegetative condition should remain stable and/or continue to improve provided sheep distribution and utilization levels are followed.

Old erosion control work and changes in grazing management has been effective from the 1960's and revegetation has occurred on the majority of the area. A few of the check dams are beginning to fail however and may lead to some potential erosion in the future.

This allotment contains fencing on the allotment boundaries but no interior fences and no water developments.

The following summarizes the history of stocking on the allotment since 1981:

1981 AMP for Bear Creek and Crystal Creek S&G allotments

Pete's Hole excluded from livestock grazing except as forage reserve for drought and trailing purposes. Capacity was estimated at 1125 SMs for Bear Creek and 1645 SMs for Crystal Creek (total estimated capacity 2770 SMs) and stated there were stocking issues and estimates should be refined by comparing scorecard estimates to actual livestock use and forage use surveys.

SM=Sheep Month=one ewe with one lamb for one month

Permitted numbers were as follows:

Bear Creek	800 Ewe/lamb	7/1-9/10	1867 SMs
Crystal Creek	1000 E/l	7/1-9/10	2333 SMs
total permitted			4200 SMs

Bear Creek 1981 range analysis showed following condition and trend on primary range:

Bear Creek	13% good condition
	36% fair condition

	51% poor condition
	79% downward trend
Crystal Creek	24% good condition
	73% fair condition
	51% poor condition
	3% downward trend

1987 Range Analysis

Showed capacity estimated at 4011 SM but reduced by 1671 SMs due to range closed to livestock grazing and designated for wildlife use, so the capacity for livestock is estimated at 2340 SMs (Bear Creek S&G, 1988). Two years of utilization monitoring followed this and then 1989 Addendum developed.

1989 AMP Addendum

After the two years of utilization monitoring and additional analysis was completed, stocking capacities were estimated for both wildlife and livestock at 2497 SM for Bear and Crystal Creek combined. The estimated capacity for livestock alone was determined to be 967 SMs for Bear Creek and 1416 SMs for Crystal Creek for a total of 2383 SMs.

Stocking was adjusted and Bear Creek and Crystal Creek were combined into one allotment with one band permitted as follows:

Bear/Crystal	1100	E/1 7/06-9/10	(2.2027)	2423 SMs Permitted
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Due to the reduction in stocking rates and higher issues elsewhere on the District, this sheep allotment has not been monitored intensively in the past several years.

Beaver Creek S&G

Beaver Creek S&G is split into two distinct areas. The first is located west of Highway 14A and east of North Beaver Creek and lies adjacent to the Whaley Creek and Little Horn S&G allotments. Elevations range from approximately 8,200 feet to 9,200 feet. The allotment contains approximately 4,175 acres of which 1,464 acres are considered suitable for livestock grazing based on the 2006 Updated Analysis (appendix F). The suitable range is predominantly located in upland ridge top sites dominated by Idaho fescue and upland carex. Some sagebrush-grasslands are present and prescribed burning occurred in 1982 below the Observation Point overlook in the South Beaver Pasture, and aerial ignition of Bear Creek Mesa occurred about 2002 but neither burn were very successful, with only small areas and control lines burned. Bear Creek Mesa is the second area of the allotment and lies about 3.0 miles west of the Observation Overlook. It is located on a southerly facing slope at about 6,000 feet to 9,400 feet elevation. It consists of steep face country with a traditional stock trail up the steep face which consists of mountain mahogany. The upper elevation of the mesa consists of sagebrush grassland slopes with stands of Douglas fir. Conifer encroachment into the meadows is very evident and has reduced the available forage for livestock and big game. Big game uses the mesa in years of light snow. Both North and South Beaver Creeks run through the allotment and North Beaver Creek is a water source for both the Whaley Creek and Beaver Creek S&G allotments. Species found along the riparian areas include willows, aquatic sedge, beaked sedge, Deschampsia, pussytoes, and other forbs.

Beaver Creek was historically stocked with one band of sheep in a deferred grazing since the 1930's. Recommended forage use was 75% of the forage produced at that time. Utilization records show that areas of heavy and moderate forage use became traditional and a downward trend was shown in the 1981 range analysis on about 48% of the allotment. Capacity was

estimated at about 2,721 SMs and permitted was 2,785 SMs. In 1981, a new AMP was developed and outlined a deferred rotation with 1,100 sheep permitted from 6/26-9/10 (2,785 SMs Ewe/lamb). Forage utilization surveys done in 1980 revealed the allotment to be properly stocked and the downward trend was caused from former poor distribution of sheep rather than overstocking (Beaver Creek, 1981).

In 1986, the Beaver Creek S&G allotment was combined with the Spring Creek S&G allotment and one band of 1,100 head of sheep was permitted from 7/06-9/05 (2,242 SMs Ewe/lamb). Spring Creek was grazed for about 1,100 SMs (30 days) which resulted in about 1,142 SMs of use on Beaver Creek S&G. Bear Creek Mesa (306 SMs estimated capacity) was dropped from the annual rotation in 1986, but it remains as part of the allotment. The addition of Spring Creek S&G made up for some of the loss in capacity. This resulted in approximately a 59% reduction in stocking rate on Beaver Creek S&G. (2,721 SMs capacity – 306 SMs Bear Creek Mesa = 2415 SMs capacity left on Beaver Creek Unit A; 2242 permitted on Beaver and Spring- 1100 SMs on Spring = 1142 SMs to be grazed on Beaver Unit A; therefore previous stocking was 2,785 SMs – 1142 SMs = 1643 SMs less/2785 = 59% reduction). A 12 mile trail of sheep from Beaver Creek S&G to Spring Creek S&G allotment was required to make this rotation work.

In about 1991, alternative rotations were tried in efforts to reduce this trailing and provide suitable range closer to Beaver Creek S&G. Permittees changed over the years, which resulted in different livestock management operations and flexibility. In 2002, Spring Creek was no longer needed in the rotation due to less sheep numbers being grazed in a rotation that included the Bear/Crystal Creek S&G, Beaver Creek S&G, and Antelope Ridge S&G allotments.

This allotment is unfenced and contains no water developments. Due to the reduction in stocking rates and higher issues elsewhere on the District, this sheep allotment has not been monitored intensively in the past several years.

Summary of Antelope Ridge, Bear/Crystal Creek, Beaver/Spring Creek Allotments History 1996-present.

This summary provides a snapshot of what has occurred since 1989 on these allotments and how they came to be managed in one rotation with one band of sheep since 2002.

1989-1996 these were permitted with separate bands on each allotment as follows:

Bear/Crystal	1100 Ewe/lamb	7/06-9/10	(2.2027)	2423 SMs
Beaver/Spring	1100 E/l	7/06-9/05		2242 SMs
Antelope Ridge	1000 E/l	7/06-9/10		2367 SMs
Total				7032 SMs (E/l)

By 1996 one common permittee had acquired the Antelope Ridge S&G allotment (1984), Bear/Crystal S&G, and Beaver/Spring S&G allotments (1996) which provided flexibility in management and rotations.

In 2000, at the permittee's request during permit re-issuance, a variable numbers/season permit (not to exceed 6,608 SMs) was issued for all three allotments to be run in common. This changed the season of use to 7/06-9/10 on all three allotments and reduced the stocking rate across all three allotments by about 6%.

Bear/Crystal, Beaver/Spring, Antelope Ridge	3000 Ewe/lamb	7/06-9/10	
Total			6608 SMs (E/l)

In 2002, the permittee waived permit back to Forest Service in favor of no one. The Forest had capacity available to grant and Shoshone NF permittee Regan Smith needed to move somewhere else due to wildlife issues where he was. His term permit was moved to the Bighorn National Forest on Bear/Crystal Creek, Beaver Creek, and Antelope Ridge S&G allotments. He runs one band of 1600 dry ewes across all three allotments in a deferred rotation. The season of use was adjusted with a later off date to match the permitted SMs he had on the Shoshone. He is permitted the following:

Bear/Crystal, Beaver Creek, Antelope Ridge S&G 1600 dry ewes 7/6-9/30
Total 4576 SMs (dry ewes)
Would be equivalent to 3,052 SMs (e/l)

This reduced the stocking rate by another 54% overall across these three allotment from 2000-2002 both because of reduced numbers and dry ewes being run instead of ewe/lambs so the forage consumption is less.

Finger Creek C&H

The Finger Creek C&H allotment lies south of the hydrographic divide along the Hunt Mt Road and is bordered by the adjacent Grouse Creek S&G allotment to the west and Wiley Sundown C&H allotments to the east. Elevations range from approximately 8,600 feet to 9,600 feet. The suitable range is predominantly high elevation uplands with Idaho fescue, carex, and Danthonia vegetation. Some sagebrush-grasslands exist in the areas of deeper soils. Riparian areas consist of the headwaters of Three Springs Creek and about ½ mile of Bone Creek. Bone Creek is split between Grouse Creek S&G and Finger Creek S&G. The allotment contains approximately 2,667 acres, of which 1,833 are considered suitable for livestock grazing based on the 1989 range analysis (Appendix F).

Finger Creek was originally a sheep and goat allotment from at least 1933 until 1974. The most current AMP dated 2/25/1969 spelled out a rotation in which Finger Creek was used in a rotation with two other sheep allotments and was rested every third year. It was considered for partial conversion of sheep to cattle as well. Records in the 2210 allotment file show the allotment was converted to cattle on a temporary basis in 1974 -1978, was permanently converted to a cattle allotment in 1979, and was grazed season long until 1987. In 1987 it began to be used in a two pasture rotation with the adjacent permittee from the Wiley Sundown C&H allotment. Grouse Creek S&G was added as a third pasture to the rotation on a trial basis in 1991, 1998, 2000, and 2004. Spring Creek S&G was added as a third pasture to the rotation on a trial basis in 1987-1988, 1992-1997, and 2003. Spring Creek was permanently converted from sheep to cattle and was incorporated as a pasture with the Wiley Sundown C&H allotment in 2005 through the Tongue EIS Record of Decision. Wiley Sundown, Finger Creek and Spring Creek have been run in common with the adjacent Prospect-Cedar Creek C&H allotment with one herd of cattle grazing in a 6 pasture deferred rotation in 2005, 2006, and 2007. Finger Creek C&H was rested in 2002 at the permittees discretion.

Documented allotment inspections have shown that livestock distribution has been a problem in some years, with heavier use noted around water sources and/or near Three Springs. Other notes said the allotment appeared to be doing very well even though season long grazing was occurring (1983). Various notes have said that a 5-10% reduction may be necessary even with the addition of Spring Creek. The most recent range analysis was completed in 1989. The Parker 3 Step transects were not re-read during range analysis, as data collection concentrated on using ocular plots with the ecodata method. Paced transects did occur along with the ecodata method, however a direct cross walk is not available from Parker data to ocular plots using ecodata. The 1989 analysis showed 0% of the primary range in satisfactory condition. Ten percent (10%) of the unsatisfactory primary range rated Fair with a downward trend, 58% Fair with trend not

apparent, and the remaining 32% showed Poor with trend not apparent. In 2005 Cluster 2, T1 was re-read and the results were compared with 1983 Parker readings using Bighorn Bunchgrass Scorecard (avg) for both summaries. The Parker comparison showed satisfactory condition with a stable trend.

Grouse Creek S&G

This Grouse Creek S&G allotment is located south of the Hunt Mt. Road and is bordered by the Sunlight Mesa and Finger Creek C&H allotments. Elevation ranges from 7,000 feet to 9,400 feet. The allotment contains 3,904 acres of which 1,699 acres are considered suitable for livestock grazing based on the 2006 Updated Analysis (appendix F), which looked at a conversion from sheep to cattle. The suitable range is predominantly high elevation uplands with sagebrush-grassland vegetation dominated by Idaho fescue. Two riparian areas run through the allotment and include Grouse Creek on the west side and Bone Creek on the east edge which is split by a fence for a water source for the Finger Creek and Grouse Creek allotments.

This allotment was historically used as a sheep and goat allotment since at least 1925 through 1990 under a season long system. In 1991 the permitted sheep on Grouse Creek allotment were incorporated with the adjacent Wallrock-Hidden Tepee S&G allotment on a permanent basis. In 1991-1993, the allotment was grazed by cattle on a three year trial basis in conjunction with either Wiley Sundown/Finger Creek (1991, 1998, 2000, and 2004) or with Sunlight Mesa C&H (1992, 1993, 1996, 1997, 1999, 2001, 2006). Correspondence and field notes indicate that Grouse Creek allotment is marginally suited for cattle and if it is used a full time rider would be necessary to help with distribution and to keep cattle pushed off Grouse Creek.

In 1957 sagebrush was sprayed with 2,4-D on portions of the allotment, and has increased in density since. Sagebrush density is approximately 38% in the more productive areas of the allotment and has resulted in a loss of available forage for livestock and wildlife. Prescribed burning was attempted in 2005 and 2006 with marginal success in the sagebrush-grasslands, and most of the burning occurred in isolated scrub stands of spruce fir. The Bone Creek Wildfire in 2007 had similar effects, with the majority of the vegetation consumed being timber and little to no sagebrush-grasslands were consumed. Capacity of this allotment for use by cattle is estimated to be about 360 AUMs assuming even distribution, 50% use levels, 720 lbs forage/AUM (Gall, 1991), however without additional sagebrush treatment, the capacity of this allotment would be reduced. This allotment is totally fenced and has two developed sources of water.

Hunt Mt. S&G

The Hunt Mountain S&G allotment is located west of the hydrographic divide from the Hunt Mt Road to the forest boundary. Elevations range from approximately 6,300 feet to 10,100 feet. The suitable range goes from high elevation sub-alpine uplands with Idaho fescue, carex, and Danthonia vegetation to lower elevation sagebrush-grasslands. Riparian areas are limited with a few natural spring fed ponds, and two developed springs provide water sources. The allotment contains approximately 9,565 acres, of which 3,609 acres are considered suitable for livestock grazing based on the 1986 range analysis (appendix F).

The 1986 range analysis summarized the allotment to be in “acceptable condition, with the potential for improvement of range condition and wildlife habitat values” (Hunt Mt, report ’86 range analysis 2210 folder). It showed capacity to be in line with current stocking levels and permanent transects indicated a small improvement in range condition.

The allotment was historically used by domestic sheep from about 1925-1984. It was in personal convenience nonuse in 1985, 1986, and 1987 and in 1988 the permittees failed to stock the allotment. In 1989 the term grazing permit reverted back to the Forest Service and was not re-allocated. The Hunt Mt #4 Unit has been used occasionally with the adjacent Wallrock Hidden

Tepee S&G Allotment since about 1990 to provide an opportunity to rest a pasture in that allotment and/or to provide water on drought years. The lower 3 units lie below the rim of Hunt Mt. and provide valuable wildlife habitat. Conifer encroachment and sagebrush densities are such that the area would benefit from having a prescribed fire to set back the encroachment, provide a mosaic within the sagebrush, and set back succession. Due to the encroachment and sagebrush densities crews were unable to relocate Parker 3 Step transects in the area for re-reading in 2007. Cattle grazing in this area would require a significant amount of fencing, and riparian habitat/wetlands could be compromised.

LITTLE HORN S&G

The Little Horn S&G allotment is located north and east of Highway 14A at the headwaters of the Little Bighorn River. Elevations range from approximately 8,600 feet to 9,600 feet. The allotment contains approximately 4,966 acres, of which 2,327 acres are considered suitable for livestock grazing based range analysis and information in a March 31, 1986 letter discussing an allotment boundary change (see Note below). The suitable range consists of high elevation sub alpine uplands consisting predominantly of Idaho fescue, carex, and Danthonia. Several tributaries to the Little Horn run through this allotment. One major tributary lies in the East Little Horn Pasture and is in a flat open meadow. The lower portion near the bridge on FDR #15 is well vegetated with riparian species and has stable stream banks and a flatter gradient at this point. The upper portion of the reach is characterized by a little steeper gradient and contains a mix of early seral species, carex, and some un-vegetated stream banks.

Sheep have been permitted on the allotment since about 1925. In 1986, the Little Horn S&G allotment was reorganized and part of the Little Bald Mountain S&G allotment was added to it which provided additional sheep range, and brought carrying capacity more in line with permitted use. It was determined that the newly reorganized allotment would have capacity for 1200 ewes/lambs from 7/6-9/15 (March 2, 1987 letter 2210 file). The carrying capacity was estimated at 2757 SMs and permitted use was 2796 SMs. A new Allotment Management Plan was written and incorporated a 4 pasture deferred rotation. Documented inspections have shown cattle periodically drift onto the allotment from the adjacent Wyoming Gulch C&H allotment, likely coming up a tributary of the Little Bighorn. Efforts have been made by the cattle permittee to stop this drift by extending the allotment boundary fence. Additional fencing may be required if this continues.

The permitted sheep are open herded and efforts are made to avoid excessive trailing or bunching of sheep. To avoid trampling or overuse on any one area, sheep bed grounds are moved every one the three days. The present permittee on the allotment also has sheep permitted on the Wallrock-Hidden Tepee S&G and Pole Creek S&G allotments, and since 2001 has voluntarily grazed fewer permitted sheep. This has provided the opportunity to graze all three allotments lighter, including the Little Horn S&G allotment. One band of sheep has been grazed in an 8 pasture rotation across the Little Horn S&G and Pole Creek S&G allotments since 2001 providing the opportunity for lighter use. One spring has been developed on the allotment on top of Little Bald Mountain. The remainder of the allotment is well watered with streams. No fences exist on the allotment except for an allotment boundary fence to the north on the Wyoming Gulch C&H allotment boundary line.

Note: There is a discrepancy in the acres shown in the 1981 Range Analysis (3,702 total acres and 1552 suitable acres), a letter dated March 31, 1986 in the 2210 Little Horn S&G file (4966 total acres and 2327 suitable acres), and INFRA (5243 total acres and 2684 suitable acres). The difference between the 1981 RA and the letter can be accounted for by an allotment boundary change that occurred in 1986, however I am not certain as to why INFRA shows an additional

277 total acres and 357 suitable. Unless additional information is located, it is my impression that the acres from the March 31, 1986 letter should be used (Appendix F).

Matthews Ridge C&H

The Matthews Ridge C&H allotment (USFS) lies south of Allen Draw and north of the Cold Springs Road and is an open sagebrush-grassland bench with heavy timber on the north and east. The west and south sides are on the National Forest Boundary. The elevation ranges from about 6400 feet to 8420 feet. The allotment contains 605 acres of which 294 acres are considered suitable based on the Updated Analysis (Appendix F). An additional 55 acres are part of a horse pasture. The suitable range is primarily located in upland range sites dominated by sagebrush-grasslands. Some of the sagebrush was treated through spraying in the early 1970's.

The allotment has been grazed by cattle since about 1925. It was part of the Forks allotment until 1955, at which time it was change to an on and off permit. It was grazed in conjunction with the adjacent BLM and private land. Prior to 1955 very little management was done on this allotment and use was generally rather heavy (1970 AMP). Since that time additional water developments have been constructed and the boundary between this allotment and the Forks C&H allotment has been fenced. One additional fence splits the allotment in half.

This allotment is managed in conjunction with the adjacent BLM Matthews Ridge C&H and Forks C&H allotments as a pasture in the rotation per the September 2, 1988 BLM EA #WY-010-EA9-064 and subsequent Cold Springs Allotment Management Plan approved 12/05/1988 for the BLM Matthews Ridge Allotment No. 0058. Management of this allotment is done by the BLM per the cooperative agreement dated 5/25/1985 found in the 2210 Matthews Ridge C&H allotment file. In 1988 a new AMP was completed by the BLM and outlined a deferred rest rotation with a maximum of 45% use. There is no annual monitoring information available for the allotment in the past 10 years.

Red Canyon C&H

The Red Canyon C&H allotment is a large open mesa located on the west slope of the forest. It lies south of Bear Creek and north of Sunlight Mesa. Elevation ranges from approximately 4,500 feet to 8,500 feet. The allotment contains approximately 6,405 acres of which 2,792 acres were considered suitable based on the 1979 range analysis (Appendix F). The suitable range is primarily located in upland range sites dominated by sagebrush-Idaho fescue grasslands. The major riparian areas are Red Canyon Creek which borders the allotment on the northwest side and Horse Creek which borders it on the east side. Both of these are steep timbered canyons and are inaccessible to livestock from the allotment. A recreational trail does go up Horse Creek. The water on the main mesa consists of several springs that feed into Horse Creek or Red Canyon Creek. No permanent cow camp or horse pasture exists on the allotment. Access with a horse is limited to riding up the trail on the face or trailering down the Hunt Mt. Road FDR#10 to the junction with Horse Creek Mesa Road FDR# and riding from there.

Allotment inspection notes in the 1950's often refer to heavy grazing and the need for a change in management. Dual use by sheep and cattle was authorized on a portion of the C&H allotment through about 1978. The allotment was a stock driveway for domestic sheep and they would graze in the spring and fall on their way to the Red Canyon S&G allotment. In 1978, a Memorandum of Understanding implemented a 55% reduction in permitted stocking and outlined a deferred or rest rotation grazing system. The sheep use was limited to four band days in the spring and on band day in the fall on the dual use areas. The 1979 range analysis indicated that 60% of the suitable range was in poor condition and 40% was in fair condition. The 1980 AMP outlined a rest rotation along with range improvements including fences, water developments, and sagebrush treatment to reverse the downward trend. Sagebrush treatment through prescribed

burning occurred in 1981 and 2003. The summary of the Parker 3 Step transects indicates that the trend is up on the allotment as a result of changes in management and we are meeting and/or moving towards meeting desired conditions.

This allotment has had considerable stocking reductions, with the first being in 1978 with the 55% reduction in stocking rate. Starting in 1993, a series of permit non-compliance issues occurred, which resulted in suspensions in permitted numbers and season, partial permit cancellations in 2003, and eventually a total permit cancellation in 2006. At present the allotment is vacant. A history of the stocking on the allotment is as follows:

Prior to 1978 permitted on Red Canyon C&H:

140 cattle 6/20-10/15 120 days=3.9452=552 AMs Drwenski

71 cattle 6/24-10/14 113 days=3.7150=264 AMs Mathias

700 sheep 6/11-9/15 77 days=2.5315=1772 SMs Howe (this included time on Red Canyon S&G—only about 5 days or 117 SMs were on C&H)

1978 MOU recommended a 55% reduction in permitted and permits reissued as follows:

63 cattle 6/20-10/15 120 days=3.9452=249 AMs Drwenski

32 cattle 6/24-10/14 113 days=3.7150=119 AMs Mathias

No sheep authorized for dual use

1988 permitted 111 mature 6/19-10/14 (118 days=3.8795)= 431 AMs

1994 permit action & settlement agreement cancelled 12% of permit & permit modification #1 as follows:

permitted 111 mature 6/29-10/09 (103 days=3.3863)= 376 AMs

2000 permit action & mediation agreement cancelled an additional 12% of permit and modification #2 as follows:

permitted 100 mature 6/29-10/09 (103 days=3.3863)=339 AMs

2002 permit action & mediation agreement cancelled an additional 50% of permit (cancellation occurred on portion of permit on Sunlight Mesa C&H and nothing on Red Canyon C&H, so permitted remained same on Red Canyon C&H) and modification #3 as follows:

permitted 100 mature 6/29-10/09 (103 days=3.3863) 339 AMs

2006 permit cancelled in full for further permit non-compliance

Nonuse occurred in 2000-2005 and then permit cancelled in full in 2006

Red Canyon S&G

The Red Canyon S&G allotment is located south of the Hunt Mt. Road, and joins the adjacent Hunt Mt. S&G and Wallrock-Hidden Tepee S&G allotments to the west and northeast. The elevation ranges from 8,600 feet to 9,600 feet with topography varying from broad ridges and basins to steep canyon. The latest range analysis was in 1981 and it was completed for grazing domestic sheep. The 1983 Analysis of the Management Situation stated that suitability was limited for cattle due to lack of season long water and steep topography, and cost prohibitive for the amount of fencing that would be required and was not considered for further study. It was estimated that cattle would probably be able to use only 10% of the suitable range at that time. The AMP at that time designated a dual use for six days on the Red Canyon C&H allotment by sheep during the early season and then the band grazed the 4 pastures on the S&G allotment under a deferred rotation.

This allotment has not been permitted for sheep grazing on a continual basis since about 1986. The two pastures that remain (John Allen & Round Top) now contain about 2,857 acres and about 1,573 suitable acres based on the 1981 range analysis for sheep (Appendix F). Water is very limited in these pastures. The John Allen Pasture has one reservoir that is fed by snowmelt and overland flow. The Round Top Pasture has one water development. Prescribed burning occurred in the Round Top pasture in about 1998 to treat sagebrush.

In 1991, the domestic sheep from Grouse Creek S&G were combined with the band of sheep on Wallrock Hidden Tepee in S&G. Two pastures from the Red Canyon S&G were incorporated with Wallrock on a trial basis until 2005 when they were permanently incorporated in with the adjacent Wallrock Hidden Tepee S&G allotment through the Tongue EIS Record Of Decision.

South Park C&H

The South Park C&H allotment is located northeast of Hyattville. The elevation ranges from 7,600 feet to 8,498 feet and is primarily a sagebrush-grassland community. It is bordered by Bureau of Land Management lands to the south and west, and the Paintrock and Forks allotments to the east and north respectively. It consists of approximately 1152 acres of which 668 are considered suitable acres based on 1976 range analysis (Appendix F). It has had cattle grazing since at least 1925, and since about 1966 it has been managed in conjunction with the adjacent Rannells BLM Allotment as a pasture in the rotation. There is minimal monitoring information available for the allotment.

Sagebrush densities from transects ran in 2007 show a canopy cover of 49%. It is believed that treatment of sagebrush with 2,4-D occurred around 1962-1963 and that is why an improvement in range condition class and an upward trend occurred from 1962 to 1976 in the location of one of long term trend transects. Since the 1976 reading, the sagebrush density has increased to the point that grasses and forbs are decreasing and a downward trend is starting to occur. Treatment of sagebrush is needed to set back succession and open up the canopy to allow the herbaceous plants to compete, increase forage production and species diversity, and improve wildlife habitat.

In 1988, a new AMP was completed by the BLM and outlined a deferred rest rotation with a maximum of 45% use per the September 2, 1988 BLM EA #WY-010-EA9-064 and subsequent Cold Springs Allotment Management Plan approved 12/05/1988 for the BLM Rannells Allotment No. 0142. Management of this allotment is done by the BLM per the cooperative agreement dated 5/25/1985 found in the 2210 South Park C&H allotment file. There is minimal monitoring information available for the allotment.

Sunlight Mesa C&H

The Sunlight Mesa C&H allotment borders the Forest Boundary on the west side and runs north to the hydrographic divide (Hunt Mt Road). It borders the adjacent Red Canyon C&H and Wallrock Hidden Tepee S&G allotments. The elevation ranges from approximately 7,400 feet to 9,600 feet and topography consists of a broad open mesa vegetated predominantly with mountain big sagebrush –Idaho fescue grasslands at the lower elevations to subalpine grasslands at the upper end. Stands of lodgepole pine can be found in the mid elevations. Riparian areas include Horse Creek, Dry Fork Horse Creek, and Cottonwood Creek of which most of the drainages are inaccessible to livestock due to steep slopes and natural barriers. The headwaters are accessible and provide water sources as do a variety of developed springs. The allotment consists of 13,045 acres of which 5,798 acres are considered suitable based on the 1987 range analysis (Appendix F). In 2007 the Long Park Wildfire and the Bone Creek Wildfire both burned through this allotment, with the primary vegetation consumed being stands of lodgepole pine and Douglas Fir. Very little sagebrush or grassland types were burned in the fires.

The allotment has been used by cattle since at least 1925. From 1925 to 1968 a yearly rotation was followed based on vegetative development, with cattle starting on Sunlight Mesa in June and moved up the allotment as vegetation developed. They would then return to the Mesa in the fall. It was basically a season long grazing system as no cross fences existed, however a rider was used. In 1968 an intensive management system was initiated. Sagebrush was treated, pasture fences were constructed, and water was developed. A five pasture rest rotation system was developed and efforts were made to make this a Demonstration Allotment, however this never fully developed. Reanalysis in 1974 indicated a large reduction in sagebrush densities and increase in usable forage had occurred due to sagebrush treatment. As a result a 15% increase in stocking rate occurred in 1975. In 1977 the rest rotation was changed to a 5 pasture deferred rotation and another 17% increase in stocking was granted.

Allotment notes in the 1980's and 1990's have shown a history of poor livestock distribution and overuse of areas on the allotment. On years when a full time rider has been used, these areas have been much smaller. The latest AMP for this allotment was written in 1983 and outlined a five pasture deferred rotation system, however it appears that the use of Sunlight Mesa as two separate pastures was not workable and the allotment has been managed under a 4 pasture modified deferred rotation. Previous notes in the 2210 range folder, 1981 range analysis, and 1983 Analysis of the Management Situation, spoke to a need for at least a 16% reduction in stocking on the allotment to bring permitted in line with available capacity.

A 53% reduction in stocking levels occurred on this allotment due to non-compliance issues by one of the permittees between 1993 through 2003, which resulted in one grazing permit on the allotment being permanently cancelled. This reduction in permitted numbers subsequently brought the stocking in much closer alignment with the 1987 Range Analysis. The 1987 Range Analysis estimated stocking capacity to be 1,860 AUMs, and the present stocking after the permit cancellation is 1,371 AUMs. It is estimated that resource improvements on the ground, due to the reduction in stocking from the cancellation, will be realized over the course of the next 10-20 years.

Sagebrush treatment has occurred in the allotment in the early 1970's through spraying, and again in about 2003. Treatment has proved to be effective in increasing forage productivity and improving wildlife habitat. Additional areas of dense sagebrush are on the allotment and would benefit from future treatment.

Whaley Creek S&G

The Whaley Creek allotment is adjacent to the west side of the Forest Boundary near Hudson Falls and runs north to the top of Bald Mountain. It is located between the adjacent Beaver Creek S&G and Bear/Crystal Creek S&G allotments. Elevations range from approximately 6,200 feet to 9,800 feet with three elevation zones. The first zone lies at the foot of the Bighorn National Forest and consists primarily of a low foothill site, dominated by mountain big sagebrush with an average elevation of 7,000 feet. The second zone is a transition area from the foothills to the subalpine uplands, and consists of steep break lands with the elevation ranging from 7,000 to 9,000 feet. North Beaver and Whaley Creek run through this area creating a series of drainages and steep ridges. The third zone consists of rolling subalpine uplands with elevations ranging from 9,000 to 9,800 feet. The allotment contains 6,396 acres of which 2,792 acres are considered suitable for livestock grazing based on the 1981 Range Analysis which includes 380 acres of BLM (Appendix F). The suitable range is primarily located on upland range sites, and the vegetation varies by elevation. The low elevations are dominated by mountain big sagebrush with a bluebunch wheatgrass understory. The mid-elevation sites have Douglas-fir bordering streams and on steep north facing slopes. The alluvial soils in the drainage are dominated by mountain big sage with a spike fescue-bluebunch wheatgrass-Idaho fescue understory. The south

facing slopes in this zone are dominated by curleaf mountain mahogany; mountain big sagebrush-Idaho fescue- spike fescue dominates the ridge tops. The high elevation areas are typical of the subalpine grasslands of the Big Horns. A wide variety of sedges, grasses, and forbs are present and sagebrush occurs on the deep alluvial soils.

This allotment has received rest on 3 of the 4 pastures since 2003, except for some incidental use by the adjacent band as they trailed through to other country. Whaley Creek pasture has been grazed lightly by the adjacent band of sheep in late June from 2003 to 2006 to provide early season forage. The 1981 AMP described the past history of the allotment and included notes that cattle were run on the allotment until 1955, however the rough topography limited the amount of usable range and the cattle stayed along the creek bottoms, heavily grazing these areas. Attempts to force cattle to use slopes and benches were unsuccessful. The Hudson Falls pasture lies at the foot of the mountain and is a combination of BLM, Forest Service, and private land. The BLM and FS have an MOU that outlines the management agreement of this pasture (dated 4/16/1993) and the BLM is responsible for monitoring. Cattle or sheep may be grazed on this pasture but under no circumstances are cattle authorized on any other portions of the Whaley Creek S&G allotment. It was converted to sheep in 1956. Prescribed burning occurred in the sagebrush grasslands in Whaley Creek pasture about 1983, and in Hudson Falls pasture in the 1990's.

Wiley Sundown C&H

The Wiley Sundown C&H allotment lies south of the hydrographic divide along the Hunt Mt Road and is bordered by the adjacent Finger Creek C&H allotment to the west and Cedar Creek drainage to the south. Elevations range from approximately 7,200 feet to 9,775 feet. The allotment contains approximately 4,262 acres, of which 1,814 acres are considered suitable for livestock grazing based on the 1989 range analysis (Appendix F). The suitable range is predominantly high elevation uplands with Idaho fescue, carex, and Danthonia vegetation. Some sagebrush-grasslands exist as well. Riparian areas consist primarily of the headwaters of Three Springs Creek and tributaries into Cedar Creek, which are inaccessible by livestock except for the headwaters.

Wiley Sundown was formerly a sheep and goat allotment from about 1925 until 1983. It was fenced in about 1971 for herderless grazing. It was converted to a cattle allotment in 1984, and in 1987 it began to be used in conjunction with the adjacent Finger Creek C&H allotment to create a two pasture rotation. Grouse Creek S&G was added as a third pasture to the rotation on a trial basis in 1991, 1998, 2000, and 2004 and Spring Creek S&G was added as a third pasture to the rotation on a trial basis in 1987-1988, 1992-1997, and 2003. Spring Creek was permanently converted from sheep to cattle and was incorporated as a pasture with the Wiley Sundown C&H allotment in 2005 through the Tongue EIS Record of Decision. Wiley Sundown, Finger Creek and Spring Creek have been run in common with the adjacent Prospect-Cedar Creek C&H allotment with one herd of cattle grazing in a 6 pasture deferred rotation in 2005, 2006, and 2007. Wiley Sundown (pasture) was rested in 2002 for resource recovery due to utilization levels in 2001.

The 1989 Range Analysis showed 29% of the primary range to be in satisfactory condition. The remaining 71% of primary range was classified as unsatisfactory (4% rated as Poor with a downward trend, and 67% rated as Fair with trend not apparent).

Documented allotment inspections over the past years have shown that livestock distribution has been a problem in the past with heavier use noted around water sources. Limited water and poor salting practices have led to problems with trailing to and from water. Changes in salting practices have occurred in the past 10 years, but lack of water continues to be an issue, particularly on years of low precipitation. A cabin for management of the allotment burned down

in about 1974, but no new facility has been authorized. A temporary camp and horse pasture is authorized for a rider annually, but leaving horses unattended overnight or for the summer without a permanent pasture fence is not desirable. The permittee/rider usually hauls horses up the mountain and stays a night or two and then hauls them back off. Due to the limited water sources, if a rider is not employed a minimum of 3 days per week, key areas reach use levels quickly and pasture moves must be made although other areas may have only received light use.

Desired Condition

The desired future condition for uplands and riparian vegetation is shown in the benchmark table shown in Appendix C. In addition, Appendix D shows these benchmark sites, associated key areas, and if meeting or moving towards meeting desired condition.

Environmental Consequences

Methodology

The analysis was based on historic Range Analysis data where available, review and comparison of Parker 3 Step transect data to determine long term trend, photo interpretation from photo points in uplands and riparian areas where available. The Forest Plan suitability GIS layer was reviewed and compared with the latest Range Analysis maps for each allotment. Forest Plan suitability analysis was a modeling exercise that looked at the broad scale level of suitability. The Range Analysis maps were developed based on site specific data collection and analysis, and provide a more accurate picture of individual allotments. Appendix E (Criteria for Classification of Rangeland Suitability) and Appendix F (Rangeland Suitability Analysis) provide the criteria that were used for classification of rangeland suitability in this analysis. Professional judgment and past on the ground experience on these allotments by long term Range Conservationist on the district was used as well.

Incomplete and Unavailable Information

For some of the allotments, there is little recent information available for annual utilization levels and patterns. These are typically allotments that had less numbers being run or were in nonuse which made them lower priority for monitoring.

Spatial and Temporal Context for Effects Analysis

Effects Timeframes

The timeframes on which the analysis is based upon are necessary in order to more clearly analyze the effects of livestock grazing on the resources. For the purpose of this project, short term effects are defined as occurring within or lasting five years or less. Long term effects are those occurring after or lasting greater than five years. These definitions apply to all resource areas.

Effects Definitions

Direct environmental effects are those occurring at the same time and place as the initial cause or action. Indirect effects are those that occur later in time or a spatially removed from the activity, but would be significant in the foreseeable future. Cumulative effects result from incremental

effects of actions, when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Reasonably foreseeable is defined as the life of the analysis document – in this case 15 to 20 years.

Cumulative effects can result from individually minor, but collectively significant actions taking place over a period of time. Cumulative effects analysis involves assumptions and uncertainties. Cumulative effects analysis provides the opportunity to evaluate future management options in the context of other developments in the analysis area. The sum of effects from individual activities in addition to those of the alternative being analyzed must be measurable in order to be considered a cumulative effect. The boundary for cumulative effects analysis is the analysis area unless otherwise stated.

Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

The cumulative effects table can be found in Chapter 3 of the EIS. This table was used to determine the actions that are relevant to cumulative effects analysis for the rangeland vegetation resource, which includes upland vegetation, riparian vegetation, including aspen and willows, and invasive species. The following list of cumulative effects is not in order of relative importance, but provides a rationale as to why they were considered relevant or not relevant for this analysis.

Activities considered relevant include:

Fire suppression: Fire suppression activities have increased the risk for large, stand-replacing fires in the analysis area. If a fire of this type were to occur within the analysis area it could produce, measurable, short-term (< 5 yr) effects to rangeland vegetation, and potentially measurable, long-term effects as well. In addition, with the absence of wildfire, conifer encroachment into meadows and aspen stands has increased, and there has been a decrease in the amount of forage available within these meadows. This activity is relevant to cumulative effects analysis.

Bone Creek Wildfire: The Bone Creek Wildfire occurred in 2007 within part of this analysis area. The fire did not advance into sagebrush grasslands or meadows for the most part, except in areas where the fire intensity was great enough to carry it. It primarily stayed confined to stands of continuous timber and isolated pockets of dead and dying trees. The fire created openings in natural barriers that previously acted as effective barriers between pastures and allotments. Livestock may now have access to areas previously not grazed, but the effects are not yet known. This activity is considered relevant to cumulative effects analysis.

Hunt Mt Prescribed Fire EA: Prescribed fire activities have occurred and are ongoing within the analysis area under the Hunt Mt. Prescribed Fire EA completed in 1999. The use of prescribed fire has a positive effect on the livestock grazing and range vegetative resource; because it improves the quality and quantity of forage and improves livestock distribution across the landscape by creating earlier seral stages within the sagebrush-grassland community. Therefore this activity is considered relevant to cumulative effects analysis.

Aspen Regeneration & Meadow Encroachment: Activities associated with aspen regeneration and meadow encroachment are through the use of hand felling with chainsaws. It is anticipated that this activity would not remove sufficient vegetation to result in a measurable effect to range vegetation or livestock grazing within the analysis area, but it was considered relevant to cumulative effects analysis.

Past Timber Harvests: Timber harvest activities have minimal to no effects on existing rangeland vegetation, as the sales are within stands of timber that provide little if any forage for livestock. However, these harvest activities may provide some transitory range. This occurs when the timber is harvested, and the subsequent natural regeneration of the harvest areas begins to grow grasses and forbs. Livestock will move into these areas and take advantage of the new forage opportunities, which may pull some of the grazing pressure off adjacent range vegetation. This in hand may provide a transitory forage base which is estimated to occur for about 5-40 years depending on how fast the timber regeneration occurs and the subsequent shading effect causes the grasses/forbs to drop out of the regeneration area. The transitory range and subsequent shift in foraging habits is not expected to be widespread across an allotment. This transitory range however is not considered part of the suitable rangeland and stocking would be not increased as a result.

In addition harvest activities may provide greater access for livestock to access other areas of the allotment, so different patterns of use may be possible. The only timber sales within the cumulative effects table that lies within or adjacent to an allotment in the analysis area are the Cold Springs Timber Sale and Bald Mountain Salvage Sale.

Harvest activities can also eliminate natural barriers to livestock when stands are opened up, which can result in the need for manmade barriers such as fencing. These are typically analyzed in the analysis for each timber sale.

Timber harvest activities can have effects on the spread of noxious weeds. Ground disturbing activities that occur typically include temp roads, skid trails, and landings. If weeds already exist within an area there is potential for them to be spread through harvest activities. Design criteria within sales calls for washing of harvesting equipment prior to entering and leaving a sale, to help with not introducing more weeds into an area. This activity is considered relevant to cumulative effects analysis.

Activities not considered relevant to cumulative effects include:

Bighorn Sheep reintroductions: The reintroduction of Bighorn sheep would not add measurable effects to the range vegetative resource, livestock grazing, or invasive species within the analysis area. This activity is not relevant to cumulative effects analysis.

Move domestic sheep from Shoshone NF to active allotments on Bighorn NF: This action occurred in 2002 where livestock were historically grazing, and this action merely moved a band of sheep from one Forest to another where domestic sheep grazing had been ongoing. In addition, it resulted in a reduction in AUMs grazed on the ground and would contribute positively to the allotments affected. Therefore it would not add cumulatively to range vegetation or livestock grazing or invasive species.

BLM Cody Office Land Use Development Plan: Land management decisions on adjacent BLM lands would not contribute cumulatively to range vegetation resource or livestock grazing within this analysis area. This activity is not relevant to cumulative effects analysis.

Forest Insects and Disease: The presence of insects and disease in timber stands (is not expected to effect range vegetation. Therefore, the presence of insects and disease does not add cumulatively to livestock grazing or range vegetation resources, and is not relevant to cumulative effects analysis.

Hunt Mountain Motorized Travel Plan: This decision restricted summer motorized travel to using designated routes, identified the motorized travel system, and closed some system and non-system roads and trails. These activities should decrease impacts to livestock grazing by decreasing the disturbances from motorized vehicles on distributed livestock. Areas closed to

motorized travel should respond positively by revegetation of the range resource. The spread of any invasive species would be most likely to occur on designated routes, and not spread out across the rangelands where travel was previously unrestricted. The effects of the Hunt Mt Travel Management decision are expected to be beneficial, and would not contribute cumulatively to actions associated with the Beaver Creek project. This activity is not relevant to cumulative effects analysis.

Livestock Grazing on adjacent allotments and on BLM Lands: These activities do not add cumulatively to effects within the analysis area. They are ongoing activities that have been occurring since the early 1900's. Therefore, these activities are not relevant to cumulative effects analysis.

Medicine Wheel NHL: No activities associated with this MWNHL would add cumulatively to the effects of the alternatives analyzed in this AMP project. This activity is not relevant to cumulative effects analysis.

Outfitter and Guide use: Outfitter and guide use is permitted under special use administration within the area. It includes activities such as horseback rides, hunting, and fishing. Permits include language to minimize effects to range vegetation by horses, within permitted camp areas. This includes guidelines for allowable utilization levels, and/or the use of supplemental feed. The amount of forage that any stock permitted under O&G permits do utilize is minimal, and would not add cumulatively to what is ongoing with livestock. This activity is not relevant to cumulative effects analysis.

Prescribed Fire on FS and adjacent BLM lands: Prescribed fire on allotments or BLM lands adjacent to the analysis area would not have effects on livestock grazing within the analysis area, because these adjacent lands are not part of the rotations. They would not add cumulatively to livestock grazing or the range vegetative resource within the analysis area. This action is not relevant to cumulative effects analysis.

Alternative 1 – No Action/No Grazing

Direct and Indirect Effects Common to All Allotments:

Alternative 1:

Direct and Indirect Effects:

Alternative 1 would eliminate all domestic livestock grazing from the National Forest Service lands within the analysis area. The forest will not meet the Forest Plan goal of providing livestock grazing that contributes to local community stability under this alternative. - Livestock would have no conflict with heritage resources, recreation or wildlife. There will be no soil compaction, streambank alteration, or impacts to vegetation by permitted livestock.

Domestic livestock would not be used to manipulate vegetative conditions on this portion of the Forest. Livestock effects to areas of upland and riparian rangeland vegetation would no longer occur. Some change would be expected in reproductive ability of plants and vigor, as well as in species diversity, plant community composition, and cover. Long-term trend of rangeland vegetation on a landscape scale would likely be toward later seral plant communities, with the exception of small isolated pockets of vegetation. This will affect and could be a problem for plant species dependent upon early seral habitats. It is expected that areas showing downward trend or not meeting forest plan guidelines, would move towards meeting Forest Plan until species composition reaches or approaches the potential natural community. These smaller areas may not improve due to the species composition, repeated

use by wild ungulate, and shading effects of the surrounding timber. It is estimated that this would represent less than 5% of the rangelands in the area. The Hunt Mt. and Red Canyon S&G allotments had livestock grazing removed approximately 22 years ago, and would be expected to show a similar change, however it may not be as dramatic since the animals have been removed for some time now and the vegetation has had an opportunity to adapt to no livestock grazing. In general, changes would be expected to be quicker in riparian vegetation than in upland vegetation due to the amount of water that is present within a riparian zone. Changes would be expected to take place over the next 10-20 plus years.

Litter accumulation would also increase which would help protect the soil surface and decrease the rate of erosion in areas with poor soil protection.

Aspen and willow stands are expected to improve in health and regeneration with the removal of one species of browsing animal in many areas. Some stands however, will continue to be heavily browsed by wildlife. Wildlife, particularly deer, can have a large effect on the regeneration of new aspen trees when sprouts are confined to small areas. The aspen understory should increase in species composition and plant vigor with the removal of livestock.

Big sagebrush would continue to be a common key component of the species composition in open parks throughout the analysis area with or without livestock grazing. The removal of livestock grazing may affect the density of sagebrush plants in these parks by increasing the health and vigor of the herbaceous plant species thereby providing more competition to sagebrush seedling establishment. In a similar manner, the conifer encroachment along the edges of these open parks may also be at a slower rate. The removal of livestock would no longer create disturbances on the edges of the parks, and desirable conditions for conifer seedling establishment would be reduced. In the absence of prescribed fire however, the density of big sagebrush stands would continue to increase in some areas, which could lead to a decrease in health and vigor of the herbaceous plant species and lead to climax communities. Similarly, the lack of prescribed fire in meadows could lead to a decrease in meadow sizes as conifer encroachment continues into grassland and sagebrush-grassland ecosystems.

Although big game will continue to use areas across the landscape, excess forage will not be removed annually by domestic grazing animals, and will accumulate, particularly in areas of high production. Build up of fine fuels will increase the potential for wildfires to occur and for them to carry across rangelands.

Maintenance of range improvements by grazing permittees will no longer be required or completed. The Forest Service may decide to perform maintenance on a few improvements for recreational or wildlife uses. Grazing permittees will be reimbursed for their portion of the range improvements on the allotments (36 CFR 222.6(a)). Fences, springs not needed for wildlife, and cow camps would be removed as funds become available.

Cumulative Effects

Alternative 1: This alternative would remove future domestic livestock grazing impacts from the multitude of activities occurring on the land area under analysis. In addition to beneficial the effects on aspen and willow through removal of livestock grazing, the aspen encroachment project would help regenerate and maintain aspen in some areas.

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans (Heading 4)

Recommendations made within this report follow the direction provided in the revised Forest Plan. The Forest Plan was prepared to meet laws and regulations such as the Forest and Rangeland Renewable Resources Planning Act (1974), NFMA (1976), and NEPA (1969).

Alternative 2 – Current Management

Under the No Change Alternative, livestock grazing would continue as prescribed under the current Allotment Management Plans (AMPs) and Annual Operating Instructions (AOIs) for the 10 of the grazing allotments as they have been implemented over the past several years (Antelope Ridge S&G, Bear/Crystal Creek S&G, Beaver Creek S&G, Finger Creek C&H, Little Horn S&G, Matthews Ridge C&H, South Park C&H, Sunlight Mesa C&H, Whaley Creek S&G, Wiley Sundown C&H). The remaining 4 allotments would remain vacant (Grouse Creek S&G, Hunt Mt. S&G, Red Canyon C&H, and Red Canyon S&G). The Bighorn National Forest Vegetation Grazing Guidelines would continue to be used and would determine adjustments needed based on utilization monitoring. It is assumed under this alternative that annual grazing utilization guidelines will be met as defined in the AOIs for individual allotments, Forest Plan, and Bighorn National Forest Grazing Guidelines.

Design Criteria

No additional design criteria other than that shown in Chapters 1 and 2 are needed.

Direct and Indirect Effects Common to Active Allotments

Livestock effects to areas of upland and riparian rangeland vegetation would continue to occur in a manner similar to historic patterns and at levels consistent with the revised Bighorn Forest Plan guidelines for forage use. These effects would be through grazing and browsing on aspen, riparian, and upland vegetation, as well as physical impacts to soil from livestock hoof action and litter production.

Plants will maintain their vigor and reproductive ability, species composition, and cover. Plant community composition would be expected to remain similar in grassland communities, except in areas where the absence of wildfire and prescribed fire has led to an increase in conifer encroachment and a decrease in rangeland area. Long-term trend of rangeland vegetation on a landscape scale would likely be toward later seral plant communities with the exception of smaller areas where livestock may congregate, or areas of vegetation where wild ungulate impacts continue to repeatedly occur. It is anticipated that less than 5% of the uplands in the analysis area make up these isolated pockets. Benchmark sites would be expected to show a trend toward desired conditions, but this would occur more slowly than in alternatives 1 and 3.

Livestock grazing would directly affect litter accumulation, as current levels of grazing would continue. Litter accumulation would be less under alternative 2 than alternative 1 for the allotments that are permitted to be grazed under term permits. Current erosional forces will continue.

Aspen stands are very limited within the analysis area. The combination of livestock and wildlife browsing on aspen stands will continue to have a negative effect on the successful regeneration and long-term sustainability of some of these stands. Wildlife can have a large effect on the regeneration of new trees when new sprouts are confined to small areas. Without

prescribed fire occurring in timber communities, it is expected that aspen stands will continue to decrease in size and be lost due to conifer encroachment, in particular in the mid elevation areas where significant encroachment has already occurred.

Big sagebrush would continue to be a key component of the species composition in open parks. In the absence of prescribed fire beyond that covered in the Hunt Mt Prescribed Fire EA, the density of big sagebrush stands would continue to increase in some areas which could lead to a decrease in health and vigor of the herbaceous plant species and lead to climax communities of sagebrush-grasslands and result in loss of forage, litter for ground cover, and species diversity. Continued livestock grazing may affect the density of sagebrush plants in these meadows by decreasing the health and vigor of the herbaceous plant species, which would provide less competition to sagebrush seedling establishment. In a similar manner, the conifer encroachment along the edge of these open parks may also be accelerated, due to a decrease in litter and more disturbances by livestock, which creates more desirable conditions for seedling establishment.

Maintenance of range improvements by grazing permittees would continue to be required. No new range improvements would be constructed, but reconstruction of existing improvements will continue as the need arises and funds allow.

Direct and Indirect Effects Common to Vacant Allotments

The effects under alternative 2 for the four allotments that are presently vacant (Grouse Creek S&G, Hunt Mt. S&G, Red Canyon S&G, Red Canyon C&H) would be similar to those shown under Alternative 1. Since Hunt Mt S&G and Red Canyon S&G allotments have not been grazed since 1986 (vacant since 1989), many of the effects shown under alternative 1 have already occurred such as litter buildup, conifer encroachment into meadows and aspen stands, increased sagebrush densities, continued presence of noxious weeds, increased soil cover, increased plant vigor, and range trends have already shifted towards meeting or moving towards meeting Forest Plan S&Gs on these 2 allotments. It is expected this would be the trend on Grouse Creek S&G and Red Canyon C&H, however the effects would not be realized for a longer period of time since both these allotments had been grazed within the past 5 years. With the continued absence of grazing, it is expected that the full effects would not be realized on these two allotments for at least 20 years.

Cumulative Effects

The activities that would contribute to cumulative effects on livestock grazing, upland vegetation, and noxious weeds in the analysis area include prescribed fire, fire suppression, past wildfires, timber harvest, and aspen regeneration and encroachment project.

Fire suppression has led to conifer encroachment into rangelands and aspen stands. This has led to a decrease in the size of rangelands available for grazing which results in less forage available for grazing. With loss of available rangeland due to conifer encroachment, greater pressure can occur on other areas of the allotment. This in turn may lead to less livestock numbers and/or a shorter season of use in order to meet standards and guidelines. This can have an economic impact on individual operators and affects within the local communities. In addition, conifer encroachment has led to a loss of aspen stands within the analysis area. This coupled with the cumulative effects of both livestock and wildlife browsing aspen shoots has repressed aspen regeneration, and has led to a continued decline in acres of aspen over the year. These results in a loss of understory foraging for both livestock and wildlife.

Past, present and future wildfires in the analysis area will affect some of the adjacent uplands to a small extent. This is through the creation of transitory range which creates additional forage to a small extent and may lighten use in some of the adjacent rangelands. This in particular would be in the area of the Bone Creek and Long Park wildfires from 2007. While a considerable amount of the acres burned was in steeper timbered slopes in Cedar Creek, Grouse Creek, and Wiley Creek drainages, timbered areas adjacent to suitable rangeland also burned and may become transitory range. As succession progresses back to a timbered environment, this transitory range will no longer be grazed and there would be a shift in use patterns back to suitable range. A long term loss of transitory range will cause a return to previous grazing pressure on upland range vegetation assuming numbers of wildlife and livestock remain constant or increase. It is expected that this may take approximately 15-25 years for the transitory range to become re-vegetated with trees that out compete the herbaceous understory.

Past, present and future prescribed burns in sagebrush-grasslands and conifer encroachment are proposed under the Hunt Mt Prescribed Burn EA, and some prescribed burning has occurred within the past 20 years in the analysis area under various NEPA. These activities have improved the quality and availability of forage species for both wildlife and livestock. These treatments also add to the diversity in age class of sagebrush, set back succession, and improve wildlife habitat and browse quality for various species. The aspen and meadow encroachment project on the forest is expected to improve some aspen stand, but they are minimal in size in the project area. Removal of conifer encroachment into meadows sets back succession and opens up areas that were historically rangelands. This increase in forage will decrease the grazing pressure on adjacent non-treated sites. However, without additional prescribed fire activities being proposed under Alternative 2, some areas will show similar effects as described above under fire suppression.

Timber harvest activities have only occurred within the confines of the South Park C&H allotment within this project area. Transitory range may be created through harvest activities and livestock will move into these areas and take advantage of the new forage opportunities. This may pull some of the grazing pressure off adjacent range vegetation. In addition, harvest activities may provide greater access for livestock to other areas of the allotment, so different patterns of use may be possible. Cumulative effects tied to harvest activities would be similar to regeneration following a wildfire as described above.

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

Recommendations made within this report follow the direction provided in the revised Forest Plan. The Forest Plan was prepared to meet laws and regulations such as the Forest and Rangeland Renewable Resources Planning Act (1974), NFMA (1976), and NEPA (1969).

Alternative 3 – Proposed Action

Alternative 3 would allow for the consolidation of the Wiley Sundown and Finger Creek C&H allotments into a newly formed allotment called Wiley Creek C&H which would have 3 pastures. It would allow for the continuation of livestock grazing in the analysis area on 9 grazing allotments (Antelope Ridge S&G, Bear/Crystal Creek S&G, Beaver Creek S&G, Little Horn S&G, Matthews Ridge C&H, South Park C&H, Sunlight Mesa C&H, Whaley Creek S&G, newly formed Wiley Creek C&H), would convert Grouse Creek S&G to a C&H allotment and authorize

permitted use on it and Red Canyon C&H (both of which were formerly vacant) Alternative 3 would also authorize Hunt Mt. S&G and Red Canyon S&G as forage reserves (formerly vacant allotments). Vegetative treatment in sagebrush-grassland and Douglas Fir, Spruce Fir and lodge pole pine communities are also proposed under this alternative.

Alternative 3 provides for adaptive management principles on all allotments. This is expected make achievement of the Forest Plan Standards and Guidelines and Bighorn National Forest Vegetation Grazing Guidelines practicable.

Design Criteria

No additional design criteria other than that shown in Chapters 1 and 2 are needed.

Direct and Indirect Effects

Livestock effects to areas of upland and riparian rangeland vegetation would continue to occur in a manner similar to historic patterns and at levels consistent with the revised Bighorn Forest Plan guidelines for forage use for the allotments that have been actively grazed. These effects would be through grazing and browsing on aspen, riparian, and upland vegetation, as well as physical impacts to soil from livestock hoof action and litter production.

It is expected that the desired condition on those upland range sites that are in satisfactory condition will continue to meet or move towards meeting desired conditions and Forest Plan Standards and Guidelines through implementation of adaptive management strategies, grazing Best Management Practices, and the Bighorn National Forest Vegetation Grazing Guidelines. For those upland range sites that are in unsatisfactory condition, it is expected that implementation of Alternative 3 will move these sites towards meeting desired conditions; however it will be faster than Alternative 2 and slower than Alternative 1. Long-term trend of rangeland vegetation on a landscape scale would likely be toward later seral plant communities with the exception of smaller areas where livestock may congregate, or areas of vegetation where wild ungulate impacts continue to repeatedly occur. It is anticipated that less than 5% of the uplands in the analysis area make up these isolated pockets. Benchmark sites would be expected to show a trend toward desired conditions.

Plants will maintain their vigor and reproductive ability, species composition, and cover. Plant community composition would be expected to remain similar in grassland communities, except in areas where the use of prescribed fire occurs. It would be expected that there would be a decrease in conifer encroachment within some meadow types which would in turn increase the rangeland area.

Species composition and ground cover is expected to increase. It is anticipated that these changes will be realized over the next 10-20 years, as uplands are slower to respond to changes in management than riparian areas. It is expected that the slowest changes will occur on the allotments that have had reductions in stocking rates and changes in management that occurred over 20 years ago (Bear/Crystal Creek S&G, Beaver Creek S&G, Red Canyon S&G, Hunt Mt. S&G). These allotments have already shown some changes in condition and trend based on the Parker 3 step transects and would continue to show improvement, but it would be at a slower rate than those that have had reductions and changes in management within the past 5 years. Those with changes within the past 5 years would be expected to show a bigger change in condition because the effects of these reductions would not be fully realized on the ground yet. This would likely be seen on Antelope Ridge S&G and Sunlight Mesa C&H.

For the forage reserve allotments (Hunt Mt S&G and Red Canyon S&G), a majority of the changes have already occurred with the absence of grazing, and a later seral condition is

present. Range trends have already shifted towards meeting or moving towards meeting Forest Plan S&Gs on these 2 allotments. By incorporating forage reserve allotments in with existing rotations, the opportunity to rest portions of other allotments or provide deferment exists. This would provide plants with an opportunity to recover from grazing use. Grazing Hunt Mt. S&G and Red Canyon S&G as forage reserves will stimulate the plants through the effects of livestock grazing which would help reduce the potential for wolfy plants to develop.

Converting Grouse Creek S&G to a C&H allotment and adding it permanently to an existing allotment will have a positive effect by adding additional capacity without an increase in stocking to an existing allotment. It would also provide some flexibility to a permittee(s) by adding another pasture to an existing rotation and help stabilize an operation. By following utilization guidelines and developing additional water on the allotment it is expected that Grouse Creek C&H would move towards meeting Forest Plan S&Gs. Similarly, re-stocking Red Canyon C&H again would provide forage for a livestock operation within the local community. By stocking at an appropriate level and following utilization guidelines it is expected that this allotment would continue to meet or move towards meeting Forest Plan S&Gs.

Livestock grazing would directly affect litter accumulation. Litter accumulation would be greater under alternative 3 than alternative 2, but less than under alternative 1 for the allotments that are permitted to be grazed under term permits. The two forage reserve allotments may be expected to show a slight decrease in litter accumulation, but this would be dependent on how often they are grazed. Current erosional forces will continue, but these would be expected to be at a slower rate than under Alternative 2.

Aspen stands and willows are very limited within the analysis area. With vegetative treatments including prescribed fire occurring in timber communities, it is expected that some aspen stands that have decreased in size due to conifer encroachment, will be rejuvenated by treatment. This will be dependent on the size of the stands and the effects of wildlife and livestock utilization levels. By implementing a combined livestock and wildlife use level of 10% on terminal buds in aspen and 30% on willow it is expected to improve regeneration and expansion of aspen and willow stands.

Vegetative treatments proposed for big sagebrush and timber are expected to set back succession in sagebrush-grassland ecosystems, aspen ecosystems, and open meadows up that have heavy conifer encroachment. With the use of vegetative treatment projects as proposed in Alternative 3, it is expected that the density of some sagebrush stands would decrease and the availability and palatability of forage for livestock and wildlife would increase. Through mosaic burns the age class and diversity of sagebrush would improve. It is expected that prescribed fire will be most effective at the lower to mid elevations. Experience has shown that treatment of sagebrush through prescribed fire, and even wildfires, has been ineffective at elevations around 8,000-9,000 feet within the analysis area. The sagebrush has not dried out enough to carry fire, however isolated stands of timber burned well. If the use of prescribed fire, mowing, or chemical treatment is ineffective or not an option then areas proposed for treatment will increase in sagebrush density which could lead to a decrease in health and vigor of the herbaceous plant species and lead to climax communities of sagebrush and result in loss of forage, litter for ground cover, and species diversity.

Livestock grazing may affect the density of sagebrush plants in these meadows by increasing the health and vigor of the herbaceous plant species, which would provide greater competition to sagebrush seedling establishment. This is expected to be similar in Alternatives 2 and 3. In a similar manner, the conifer encroachment along the edge of these open parks may also be accelerated, due to a decrease in litter and more disturbances by livestock.

Alternative 3 would authorize the continuation of several new range improvements. Water developments and both permanent and temporary fences would be used to allow for better control and distribution of livestock and thus improve the condition and trend of riparian and upland vegetative conditions and cultural resources. In all cases the affected permittees would be responsible for about fifty percent of the initial construction costs and all of the ongoing maintenance. This is a direct increase in costs associated with range improvements over Alternative 2.

Cumulative Effects

The activities that would contribute to cumulative effects on livestock grazing, upland vegetation, and noxious weeds in the analysis area include prescribed fire, fire suppression, past wildfires, timber harvest, and aspen regeneration and encroachment project.

The cumulative effects would be the same as under alternative 2, with the exception of prescribed burning which is described below.

Past, present and future prescribed burns in sagebrush-grasslands and conifer encroachment are also present and this activity has improved the quality and availability of forage species for both wildlife and livestock. These treatments will also add to the diversity in age class of sagebrush, set back succession, and improve wildlife habitat and browse quality for various species. Removal of conifer encroachment into meadows would set back succession and open up areas that were historically rangelands. This increase in forage will decrease the grazing pressure on non-treated sites. By including additional areas for treatment under Alternative 3, the opportunities exist for improving additional rangeland forage quantity and quality.

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans (Heading 4)

Recommendations made within this report follow the direction provided in the revised Forest Plan. The Forest Plan was prepared to meet laws and regulations such as the Forest and Rangeland Renewable Resources Planning Act (1974), NFMA (1976), and NEPA (1969).

Monitoring Recommendations

A complete monitoring discussion can be found in Chapter 2 of the EIS, and this discusses implementation monitoring (short term) and effectiveness monitoring (long term), in detail.

References

- 2210, 2230, 2240 Files, Medicine Wheel-Paintrock Ranger District, Bighorn National Forest, USDA Forest Service
- Bighorn National Forest Land and Resources Management Plan, Revised 2005
- Bighorn National Forest Vegetation Grazing Guidelines (USDA Forest Service, Revised 2007)
- Table 2-4: Adaptive Management Strategies and Triggers for Livestock Grazing on the Beaver Creek Watershed Allotments
- Appendix A: Summary of Vegetative Condition for Beaver Creek Watershed Area Based on Parker 3 Step Summaries
- Appendix B: Parker 3 Step Transect Summary Trend

- Appendix C: Benchmark Sties, Current Condition, Desired Condition, and Monitoring
- Appendix D: Benchmark Sites and associated Key Areas for the Beaver Creek Watershed
- Appendix E: Criteria for Classification of Rangeland Suitability
- Appendix F: Rangeland Suitability Analysis Medicine Wheel-Paintrock Ranger District, Bighorn National Forest Beaver Creek Watershed Allotments
- Antelope Ridge, 1980 EA 2210 file
- Bear/Crystal Creek, 1989 Addendum to AMP 2210 file
- Bear Creek S&G May 2, 1988 Memo to DR, Subject Bear Creek S&G 1987 Range Analysis 2210 file
- Hunt Mt, 1986 report range analysis 2210 file
- Gall, R.Scott, 1991, April 15 Draft Analysis Allotment Consolidation/Switching Options
- Little Horn S&G March 2, 1987 letter 2210 file
- Rangeland Analysis and Management Training Guide, Region 2, USDA Forest Service 1996